

- 10)** In Python functions, positional arguments must always be provided:
- a) After keyword arguments
 - b) Before keyword arguments
 - c) Only inside default parameters
 - d) In any order relative to keyword arguments
- 11)** What value does `file.seek(0, 2)` move the file pointer to?
- a) Beginning of the file
 - b) Current position
 - c) End of the file
 - d) Line 2 of the file
- 12)** What does the SQL query `SELECT COUNT(DISTINCT Dept) FROM Employee;` return?
- a) Count of total non-null values in Dept
 - b) Count of unique non-null values in Dept
 - c) Total number of rows including NULLs
 - d) List of department names
- 13)** Which Python data structure works strictly on the LIFO (Last-In, First-Out) principle?
- a) Queue
 - b) Stack
 - c) Dictionary
 - d) Binary Tree
- 14)** If a table `STUDENT` has 5 attributes and 12 records, what are its Degree and Cardinality?
- a) Degree = 12, Cardinality = 5
 - b) Degree = 5, Cardinality = 12
 - c) Degree = 60, Cardinality = 5
 - d) Degree = 5, Cardinality = 60
- 15)** Identify the correct output for the following execution:
- ```
Python
t = (10, 20, 30)
t = t + (40,)
print(len(t))
```
- a) `TypeError: tuple is immutable`
  - b) 3
  - c) 4
  - d) 34

**Part B: Short Answer Questions (10 Questions x 2 Marks = 20 Marks)**

- 16) [Python Revision]** Rewrite the following code after removing all syntax errors. Underline each correction.

```
Python
25 = Val
for i in range(0,Val)
if i % 2 = 0:
print(i "is even")
Else:
print("Odd")
```

- 17) [Functions]** Differentiate between Positional Arguments and Default Arguments in Python functions with a code snippet.
- 18) [Functions]** Predict the output of the following Python program:

```
Python
def Update(val, num=5):
val = val + num
num = val % num
print(val, "#", num)
u, v = 15, 4
Update(u, v)
Update(u)
```

- 19) **[File Handling - Text]** Write a function CountWords() in Python to read a text file DATA.TXT and count the number of words starting with the letter 'P' or 'p'.
- 20) **[File Handling - Binary]** Write the purpose of pickle.dump() and pickle.load() methods along with their correct syntax.
- 21) **[File Handling - CSV]** Differentiate between writer.writerow() and writer.writerows() functions in the csv module.
- 22) **[Data Structure - Stack]** Given an empty stack S, trace the status of S after performing the following operations:  
Push(15), Push(25), Pop(), Push(35), Push(45), Pop(), Pop()
- 23) **[SQL]** Write SQL queries for the following requirements based on table FLIGHT:
  - a) Display distinct departure cities (Dep\_City).
  - b) Increase the fare (Fare) of all flights by 15% where Airline is 'Indigo'.
- 24) **[SQL]** Differentiate between WHERE clause and HAVING clause in MySQL with an example query.
- 25) **[SQL Data Manipulation]** Explain the difference between DELETE FROM TableName; and DROP TABLE TableName; commands.

**Part C: Case-Based Questions (5 Questions × 4 Marks = 20 Marks)**

**26) Case Study 1: Python Scope & Functions**

Consider the following Python script written by a student to calculate item totals with tax applied:

```
Python
tax_rate = 0.18
def calculate_total(price, qty=1):
 global tax_rate
 subtotal = price * qty
 grand_total = subtotal + (subtotal * tax_rate)
 return grand_total
def update_tax(new_rate):
 tax_rate = new_rate
```

- a) What will calculate\_total(100, 2) return when executed with the initial tax\_rate?
- b) If update\_tax(0.12) is called, will tax\_rate change globally? Explain why or why not.
- c) How should update\_tax() be modified so that new\_rate updates the global tax\_rate?
- d) State what type of argument qty=1 is in the calculate\_total signature.

**27) Case Study 2: Text & Binary File Operations**

An inventory manager uses binary files to store product information. Each record is stored as a list: [prod\_id, prod\_name, price, stock].

- a) Write a function AddProduct(prod\_id, prod\_name, price, stock) to append a new product record to inventory.dat.
- b) Write a function SearchProduct(pid) that reads inventory.dat and prints the product details if prod\_id matches pid, or displays "Product Not Found".

**28) Case Study 3: CSV File Data Management**

A school manages student attendance using a CSV file named attendance.csv containing fields [RollNo, Name, Class, Percentage].

- a) Write Python code to create attendance.csv and write the header row ["RollNo", "Name", "Class", "Percentage"].

- b) Write a Python function LowAttendance() that reads attendance.csv and prints all records where Percentage is less than 75.0.

**29) Case Study 4: Stack Implementation for Log Tracking**

A web server logs user session IDs in a LIFO order.

- a) Define a Python function PushSession(SessionStack, SessionID) to push a valid SessionID (string of length 6) onto the stack.
- b) Define a Python function PopSession(SessionStack) to pop and print the topmost SessionID. Handle the stack underflow condition.

**30) Case Study 5: Relational Database & SQL Commands**

Consider the following table EMPLOYEE:

| EmpNo | EName  | Dept  | Salary | JoinDate   |
|-------|--------|-------|--------|------------|
| 101   | Anish  | HR    | 55000  | 2020-01-15 |
| 102   | Meera  | IT    | 72000  | 2019-03-20 |
| 103   | Rohan  | HR    | 48000  | 2021-06-10 |
| 104   | Sunita | Sales | 60000  | 2018-11-05 |
| 105   | Vikram | IT    | 80000  | 2017-08-12 |

**Write SQL queries to:**

- a) Display the minimum and maximum salary grouped by Dept.
- b) Display EName and Salary of employees who joined between '2019-01-01' and '2021-12-31'.
- c) Display all records ordered by Dept in ascending order, and within each department by Salary descending.
- d) Count the total number of employees working in the 'IT' department.

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